

ACADEMY  
OF  
ADMINISTRATION  
MADHYA PRADESH  
BHOPAL

Conference  
on  
Mobilising  
Additional Resources  
for Higher Education

22-24 May, 1995

## A Little about us .....

**THE** Academy of Administration, Madhya Pradesh is the apex training institution of the Government of M.P. As an apex institution it organises foundational courses for all fresh entrants to Class I and Class II services of the State Government. It also provides induction training and in-service training to all officers of the M.P. State Administrative Service and the Subordinate Executive Service of the Revenue Department. It also provides regular periodic short term courses both on the general aspects of administration as well as on specific and specialised subjects of relevance and interest to the various departments of the State Government and organisations funded or controlled by the State Government. These special courses are specifically designed to meet the needs of the individual departments of the State Government or a group of inter-related departments or organisations funded or controlled by the State Government. The Academy is gradually developing expertise in conducting training courses in Developmental Administration, Decentralised Planning, Urban Basic Services for the Poor (UBSP), Public Health and elected representatives of Panchayati Raj Institutions. It has also been undertaking research projects in selected areas for the government.

The Academy has a technical wing which caters to the special needs of the various Engineering Departments (Irrigation, PWD, PHE, Rural Engineering Services) of the State Government. It also has an Accounts Training Wing to cater the training requirements of the members of the M.P. Financial and Accounts Service and also special requirements of the various departments of the State Government and public sector undertakings in the matter of financial management, inventory control, project management, etc.

The academy is recognised as one of the important training institutions for imparting training to officers of the All India Services belonging to the Indian Administrative Service, Indian Police Service, Indian Forest Service and Central Services such as Indian Economic Service, Central Health Service, etc.

The Academy has been declared as the nodal agency in respect of Training of Trainers of the various training institutions in the State and its Director General has been declared as the State Training Coordinator. To discharge this function effectively, the Academy has established the State Training Resource Centre (STRC) to help the Government departments and their training institutions in identifying their training needs, infrastructure required to meet these needs, the training methodologies to be followed etc. The Academy has identified the Training of Trainers and training in Gender Sensatisation as two major areas for providing training assistance to the departments of Government and their training institutions. The Academy has been selected as a centre for a project sponsored by ODA on "systems approach to training".

The number of training courses offered by the Academy has been increasing every year reflecting the increased importance being attached to training as a basic tool of human resources development. Thus during 1995-96 a total number of 236 training programmes have been offered.

Originally started in 1966 as the administrative training school for officers of the State Administrative Services and named as the Lal Bahadur Shastri Institute of Public Administration it was reorganised and strengthened and renamed as Madhya Pradesh Academy of Administration in the year 1975. The Academy has an independent campus of its own which is spread over an area of 43 acres abutting a lake. It has an independent residential campus

for its faculty and staff. The main institute building consists of an air conditioned auditorium, a conference room, rooms for panel discussions and class rooms with all modern facilities. It has a good library with over 25 thousand books. It also has a computer centre with 28 Micro-Computers. The Academy has all modern training aids including video and projection equipment, video camera, etc. It has a good library of both 16 mm and video films. It has acquired a Desk Top Publishing (DTP) unit. The hostel of the Academy has 175 rooms. A distinct part of the hostel has been reconditioned as the Senior Officers hostel. This wing has 40 rooms with a separate dining hall and a recreation cum discussion room. The Academy has also a well-furnished guest house with 3 suites for accommodating the guest faculty and other guests of the Academy.

A sports complex is contemplated within the Academy campus. Meanwhile facilities have been provided for games such as tennis, volley ball, badminton and table tennis. Arrangements for swimming have been provided near the campus in collaboration with the M.P. Housing Board. Regular facilities for practising yoga also exist.

The Academy has a sanctioned core faculty of 19 members. With their knowledge of the various aspects of the Government, they direct as well as coordinate training programmes of the Academy. The Academy also draws liberally for its guest faculty on sister institutions in the country as well as experienced and knowledgeable officers of the State Governments as well as the Central Government.

The training inputs are provided through class room sessions, group discussions, case studies, film shows, hands on practice, project work, field visits and on the job exposure. The courses are designed to ensure opportunities to participants to exchange their experiences and share views. Reading material specially prepared is also distributed to the participants.

The Director General is the Chief Executive of the Academy. The control and direction is exercised by a Board of Governors which is presided over by the Chief Secretary to Govt. of M.P. To ensure a certain degree of autonomy within the framework of Government, the State Government has delegated its powers to the Board of Governors in all matters which are within the financial provisions made in the State Budget.

# INSPIRATION

More resources are needed in the areas of higher and technical education for modernization and diversification but, at the same time, efforts should be made to obtain optimum returns from the present investments. There are too many requirements in the area of education and we must explore new avenues for finding resources.

Dr Manmohan Singh  
Finance Minister  
Govt. of India  
Budget Speech, 1991-92

Hitherto our institutions of higher learning have been almost entirely dependent on government funds. As Government funds are limited, we must find ways of funding these institutions from industry.

Dr Manmohan Singh  
Finance Minister  
Govt. of India  
Budget Speech, 1993-94



COMING TOGETHER



## WHY?

Winds of economic change are sweeping across the world and our country is no exception to this. In keeping with the changing economic ethos there is a trend towards curtailing the government financing of institutions of higher learning. The writing on the wall is clear: these institutions, in the near future, will have no option but to raise at least a part of their resources through their own efforts. The Punnayya Committee too has recommended that institutions of higher learning should independently raise at least 15% of their resources in the coming five years and 25% in the coming ten years.

Another aspect which has an important bearing on the subject is that, barring a few exceptions, the output of educational institutions has little social significance.

An interaction between educational institutions and the industries is likely to be beneficial to both in as much as it might help educational institutions to generate atleast a part of their resources and, more important, to come out of their ivory towers. On the other hand, the industries might benefit from a pool of readily available highly skilled, trained human resource.

This conference is a small step in the long journey of educational institutions-industry interaction which has yet to begin in Madhya Pradesh.





## WHO?

His Excellency the Governor of Madhya Pradesh, Shri Mohammed Shafi Qureshi will inaugurate the Conference. Shri Mukesh Nayak, Hon'ble Minister of State, Govt. of M.P. Higher Education Department will preside over the inaugural function.

The following eminent educationists from outside the State have been invited to act as Resource Persons :

1. Prof. Amrik Singh, former Vice-Chancellor of University of Delhi and eminent educationist
2. Dr D.K.Ghosh, Registrar, I.I.T., Bombay
3. Dr J.S.Rajput, Chairman, National Council for Teacher Education, New Delhi
4. Shri J.L.Azad, New Delhi
5. Prof. D.N.Rao, Centre for Economic Studies, School of Social Sciences, J.N.U., New Delhi
6. Prof. K.N.Reddy, National Institute of Public Finance and Policy, New Delhi
7. Dr G.C.Baveja, New Delhi

Vice-Chancellors of Universities, Principals of all Engineering Colleges, Principals of all autonomous colleges and Principals of colleges situated in industrial areas of Madhya Pradesh have been requested to attend the Conference.

Similarly leading industrialists of the State and officials of Manpower Planning, Higher Education, Industries, Finance and General Administration Departments too have been invited.

Shri Sharad Chandra Behar, Director General, Academy of Administration, M.P. and former Vice-Chancellor, Guru Ghasidas University will be available for full duration of the Conference.



# WORKING TOGETHER



**ACADEMY OF ADMINISTRATION  
MADHYA PRADESH  
BHOPAL**

**WAITING FOR YOU**

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Shri R.C.Yadav  
Shri Bharat Gupta

**CULTURAL PROGRAMME COMMITTEE**

Dr Pratibha Dube

Shri Prakash Kolte  
Shri Ajit Kumar Gupta

**SIGHT SEEING COMMITTEE**

Smt. Jaishri Kiyawat

Shri P.D.Gupta  
Shri S.K.Dhanelia

**INAUGURAL FUNCTION COMMITTEE**

Shri R.C.Jain

Shri Abhilash Dube  
Shri Surendra Peter

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**Shri Rajesh Shrivastav  
Shri Rakesh Saxena  
Shri Lalji Sonker**

## **AUDIO RECORDING COMMITTEE**

**Shri Rakesh Saxena**

**Shri Lalji Sonker  
Shri Daulat Ram**

## **READING MATERIAL COMMITTEE**

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**Shri Dinesh Mishra  
Shri Rajaram**

## **INVITATIONS COMMITTEE**

**Shri J.P.Gupta**

**Shri C.A.Abraham  
Shri S.S.Sikarwar  
Shri Ram Bhau**

## **PUBLICITY COMMITTEE**

**Dr Arvind Gupte**

**Shri R.P.Sharma  
Shri D.P.Shukla  
Smt. Shalini Mukhi**

## **HOSPITALITY COMMITTEE**

**Shri Shyam Bohare**

**Shri Namdeo Teli  
Shri Ram Prakash  
Shri Selvaj**

## **INFORMATION COMMITTEE**

**Shri Rajesh Shrivastava**

**Smt. Girija  
Shri Kishorilal**

## **REGISTRATION COMMITTEE**

**Shri V.S.Sarma**

**Smt. Kamla Rani  
Shri Chellappan**

## **ACCOUNTS COMMITTEE**

**Shri R.C.Jain**

**Shri Bachumal Baghela**

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Dr Arvind Gupte

Shri V.S.Sarma

Shri S.B.Khandekar





**CONFERENCE**  
**ON**  
**MOBILISING ADDITIONAL RESOURCES**  
**FOR HIGHER EDUCATION**  
**22-24 MAY, 1995**

**P R O G R A M M E**

**22nd May, 1995 : Experiences and Ideas**

0830 - 0930 hrs	:	Registration
0930 - 1115 hrs	:	Knowing one another
1115 - 1145 hrs	:	Tea with invitees
1145 hrs	:	Assembling in the auditorium for inaugural session
1200 hrs	:	Inaugural session
1315 - 1415 hrs	:	Lunch
1415 - 1545 hrs	:	Success stories
1545 - 1600 hrs	:	Tea
1600 - 1800 hrs	:	Enabling environment : Changes in the policies and rules
1800 - 1815 hrs	:	Tea
1900 hrs	:	Cultural programme

**23rd May, 1995 : Interaction with Industries**

0930 - 1130 hrs	:	Success stories : Response from Industries
1130 - 1145 hrs	:	Tea
1145 - 1315 hrs	:	Successful strategies: Response from Industries
1315 - 1415 hrs	:	Lunch
1415 - 1545 hrs	:	Expectations from institutions of higher education : The Perspective of Industries
1545 - 1600 hrs	:	Tea
1600 - 1800 hrs	:	Industry-institution collaboration : Strategies and models
1800 - 1815 hrs	:	Tea
1900 hrs	:	Cultural programme

**24th May, 1995 : Towards a Plan of Action**

0930 - 1115 hrs	:	Deriving general principles for concrete action
1115 - 1130 hrs	:	Tea
1130 - 1500 hrs	:	Group work : Preparation of Region-wise Action Plan (including appropriate breaks for lunch and tea at the convenience of the groups)
1500 - 1630 hrs	:	Presentation and discussion : Region-wise Action Plan
1630 - 1730 hrs	:	Valedictory session
1745 hrs	:	Tour of the city



OUR VIEWS, IDEAS, EXPERIENCES



# RESOURCE CRUNCH AND RESOURCE GENERATION IN HIGHER EDUCATION - GLOBAL PERSPECTIVES:

## How TO GO ABOUT FOR GENERATION OF INCOME

By D.K. GHOSH\*

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Basically, this Paper spells out the various structural aspects of the mechanism as to how to go about for generation of income in higher education system. Not infrequently, despite the fact that the capabilities exist for certain things, such as to generate income, in the absence of a structured or organised picture and mechanism, the reservoir of expertise and facilities often remain untapped and unutilised.

Aimed at what has been mentioned hereinbefore, it is considered necessary for a fuller background of the global scenario which would be an important input for achieving the basic aim.

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### BACKGROUND

Consequences of the second world war made all round impact in various spheres of life throughout the world. Perhaps the most striking impact was the realization of the role of higher education, particularly the role of science and technology to achieve economic prosperity and superiority of powers. Settlements of a large number of personnel on their return to home, after the second world war led to population growth and demanded expansion of higher education. It was no coincidence that practically all over the USA and Europe, 1960s were in

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RESOURCE CRUNCH AND RESOURCE GENERATION  
IN HIGHER EDUCATION - GLOBAL PERSPECTIVES:

How To Go About For Generation Of Income

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general the period of expansion of education, particularly higher education. The 18 year olds i.e. those who were born after 1942 demanded the facility of higher education. On its part, the Government was also keen to create a trained manpower through higher education system.

## DEVELOPED COUNTRIES

2. Conspicuously, the end of 1970s marked again all over the world, a slowing down trend in the pace of expansion particularly due to the strikingly high public expenditure that higher education demanded. From the beginning of 1980s, changing climate was visible in the universities in USA and Europe to curtail expenditure, at least to arrest the escalating investments in higher education. The message to generate income became clear and changing attitude and culture were clearly seen making impact ofcourse in different degrees.

3. One reason for this was the pressing demand of various other social sectors. In Japan, Public funding in higher education declined maximum, from 83.10% in 1970 to 63.10% in 1987. Next to Japan, it was UK, where, public funding declined from 71.20% in 1970-71 to 55% in 1986-87.<sup>1</sup> That was also the trend of course in varying degrees, in other developed countries.

4. In UK, following a general policy of reducing the public expenditure by the newly elected Conservative Government (1979), led by Margaret Thatcher, within a few months of its installation,

1. Financing Higher Education - Current Patterns,  
OCDE, OECD, Paris, 1990.



allocation for universities was reduced and from July 1981, through the University Grants Committee (now bifurcated into three Funding Councils called Higher Education Funding Council - one each for England, Scotland and Wales), grants of the universities were reduced on a selective basis by 6% to as high as 44% which posed threat of survival at least to a few universities and some of them had almost reached a stage of 'bankruptcy'.

5. From that time, the UK higher education system has undergone sea change in almost all respects. Constituents of the universities who initially reacted to governments action and not quite willing to accept and participate in various restructuring activities including special efforts to generate income gradually accepted the situation. Criticising the indifference and inaction of the universities to the suggestions of the Minister of State for Education and Science of the Labour Government as early as in 1969, to increase student-teacher ratio, to encourage students to study within the reach of home, to making more efficient use of buildings and equipments, to avoid duplication of facilities etc., in 1981 in a debate in the House of Commons, a Member of Parliament said that the Universities did nothing since then (since 1969 warning) to the suggestion of the Minister. He observed that "... universities walked so tall that they only had to shout loud enough that they were centres of excellence and everyone would bow. Universities walked so tall that they sometimes forgot about the ground".<sup>2</sup> Universities had to face enormous problems of restructuring, but when pushed to the wall, finally all of them rose to the occasion and they are now doing

well. They have become more transparent efficient and cost-effective. Universities moved out of UK to sell themselves 'aggressively' and generate income through international consultancies and attracting more foreign students from whom very high fees are charged. Within the country, University-Industry interaction was given a boost which helped both the universities and industry.

6. Precisely, there is a global trend to be 'cost effective' in a situation of steep competition and scarce resources. Universities in UK and elsewhere have achieved this in varying degrees, through -

- \* Enhancing Efficiency at all levels including through Educational Technology,
- \* Reduction of Expenditure,
- \* Generation of Non-Govt. Income,
- \* Enforcing Redundancy (Exit Policy)

#### DEVELOPING COUNTRIES

7. India was no exception in respect of the expansion of higher education in 1960's. As against 25 universities including institutions of deemed university level (actual number of universities was 19), 700 colleges and 2,65,917 students enrolment in higher education, by the 1970-71, the numbers rose to 93 universities, 3604 colleges and 19,53,640 students respectively.

8. During 1970s, slowing down of expansion was noticed in the developing countries. In India, the number however continued to increase due primarily to population bulge. In the case of the developing countries besides the demand of various social sectors, the need of investments in sectors that could help develop the economy was an additional important pressure, eg. agriculture, power generation, rural development, etc. Precisely, the resource crunch in higher education was felt all over the world in 1980s.

9. In India, while the universities have always faced the resource constraints, particularly the state universities in general, the real crunch has now been felt. It is really more a realization of the 'crunch, than the 'crunch' itself for the funding agencies now have been pressing the universities to generate non-govt. income and be on their own which earlier the government agencies did not, as a matter of declared policy. Even universities thought why they should, for they are doing a service to the nation and a commercial approach was not desirable.

10. In developing countries of Asia, in relation to 1960s, the public expenditure in general declined except China and South Korea. The following table-1 will show the position in this regard:

Table-1

Public Expenditure on Education as a Percentage of  
Total Government Expenditure  
in selected developing countries of Asia

Country	1965	1975	1985	1989
China	NA	4.2	8.1	12.4
India	8.7	9.4	9.4	8.5 *
Indonesia	NA	13.1	9.3	4.3 #
South Korea	15.4	13.9	28.2	23.3
Malaysia	18.5	19.3	16.3	18.2
Phillipines	25.0	11.4	7.0	NA
Thailand	20.1	21.0	18.5	16.6

\* 1987 figure

# 1988 figure

11. The following table-2 will show how the crunch is felt by the higher education sectors in some selected developing countries.

Table-2

Resource Crunch in some selected developing countries

Country	Crunch Felt
INDONESIA	<ul style="list-style-type: none"><li>* Sharp reduction in development budget from Government.</li><li>* Reduced level of operation and maintenance expenditure.</li><li>* Reduced Government support by increased fees.</li></ul>
THAILAND	<ul style="list-style-type: none"><li>* Declining Government Support.</li><li>* Drastically reduced level of Expenses.</li></ul>
REPUBLIC OF KOREA	<ul style="list-style-type: none"><li>* Reduced Govt. Grants for Higher Education.</li><li>* Reduction in Expenditure.</li><li>* Generate Income to meet rising expenses.</li></ul>
PHILLIPINES	<ul style="list-style-type: none"><li>* High Inflation Rate in late 80s (24%).</li><li>* Financial constraints.</li><li>* Looking for generation of Income</li></ul>
CHINA	<ul style="list-style-type: none"><li>* Gradual Reduction of free boarding.</li><li>* Gradual imposition of Tuition Fees.</li><li>* Generation of Income from internal and external Market.</li><li>* Reduction in Expenditure.</li></ul>

12. In order to face the crunch, these countries have drawn up plans and programmes for there is no getting away from the reality and therefore sooner the better it is before it is too late.

13. Admittedly, no government can sustain the fast escalating expenditure on higher education, particularly when there are pressures on other social sectors, and sectors demanding heavy investments for developing the economy. At the same time, it is true that the universities find the funding by the government at a level which does not help them raise and keep up the level for running the system in all the areas eg. the fast rising expenditure on salary component, general inflation factor, upkeep of the campus, removal of obsolescence, equipping the library and the liberal assistance to the students. Even for the research activities, there is hardly any funding worth the name except through projects and that too not many universities are able to win them.

14. Over a period of four years from 1984-85 and 1988-89, of the eighty universities who responded to a study of the Association of Indian Universities, in the case of a number of universities, the expenditure had increased more than 100%.

15. It is true that while the increase of expenditure is alarming, the fact remains that it is a global phenomenon. It is so because of the primarily inevitable growth of expenditure due mainly to the inflation factor and again that is a global reason, although the inflation rate differs from sub-continent to

sub-continent and country to country. During the aforesaid period, impact of the Fourth Pay Commission was also another reason for the increase in expenditure.

16. Clearly, the facts and figures as discussed and shown in this paper tell us what the global scenario is and also what is the position all over the country. Precisely, there really is a 'no getting away' situation from the reality that we must learn to handle our affairs with due vision, dedicated mission and perfect strategy to achieve the various objectives that lie ahead in the situation that we are already in. In the current context, broadly objectives are really two:

One : To Reduce the Expenditure - at least to arrest the growing expenditure on a few counts.

Two : To Generate Income -  
(a) boosting the existing sources.  
(b) tapping new sources.

17. Although the broad objectives are two, in reality, quite a few associated issues would be required to be tackled to achieve the twin objectives. For example, to reduce the level of expenditure or at least to arrest the growth in respect of certain areas, the pre-requisites are to study the possibilities and act accordingly for which a suitable mechanism should be developed.

18. For generation of income both to boost the existing sources as also to tap new ones, there must be a planned study and concerted efforts across the system. Stray efforts or half-hearted efforts cannot result into anything.

# RECOMMENDATIONS OF JUSTICE PUNNAYYA COMMITTEE ON RESOURCE GENERATION

19. At this point, it would be appropriate to refer to the relevant recommendation of the Justice Punnayya Committee (1992-93) appointed by UGC for resource generation. Briefly, the recommendation are shown in the table-3:

Table-3

## Suggestions of Justice Punnayya Committee of UGC for Resource Generation

Source	Suggestion
1. FEES	
(a) Tuition Fees	To revise with immediate effect and be periodically adjusted keeping in view the rate of inflation. There should be differential rates also to relate fees to the recurring cost of the course.
(b) Other fees (Admission, examination, library, laboratory, sports and other facilities)	To review and revise the entire fee structure and recover a significant part of recurring cost.
(c) Hostel and Mess Fees (Water, Electricity, seat rent)	To recover actual recurring cost and gradually capital cost.

contd..



2. OTHER SOURCES OF INCOME    a) Renting out facilities, eg. auditoria, class rooms, computer services, play ground, guest house, hostels, lawns, messes, etc.

b) To recover municipal service charges from campus residents as also for facilities like telephone, computing, etc.

3. CONSULTANCY MECHANISM    Universities to constitute appropriate consultative mechanism for mobilising resources. UGC to extend support.

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#### TASKS AHEAD

20. Justice Punnayya Committee recommended that the universities should generate at least 15% of the total recurring expenditure at the end of the first five years and at least 25% at the end of ten years for which universities must draw up specific plans.

21. If the universities are to generate at least 15% income at the end of five years, say by 2000 and 25% at the end of 2005, it is imperative that they must draw up plans and programmes in the right direction without loss of time. Justice Punnayya Committee has recommended that universities should constitute the appropriate mechanism and UGC should extend support in consultation with the Government.

22. How should the universities go about what should be the mechanism of rejuvenating/starting the consultancy activities.

## HOW TO GO ABOUT FOR GENERATION OF INCOME THROUGH CONSULTANCY ACTIVITIES

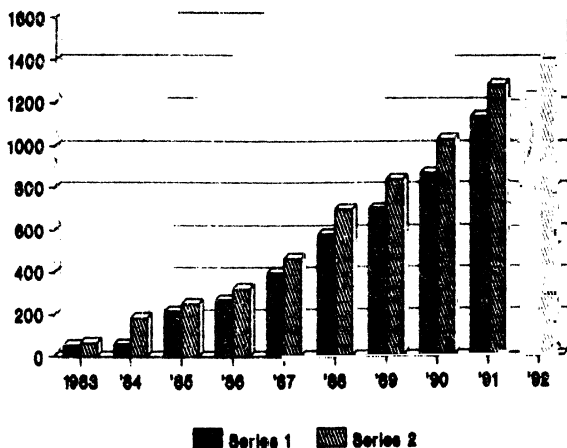
### GIVING A KICK OFF

23. Efforts to reduce expenditure and to increase income through tuition and other fees payable by students including some other means can without serious difficulties, but with definite plans, be made and in most cases, targets can be achieved without great expertise. But introducing the mechanism of consultancy activities or to give a boost to that, require a good deal of thinking for stray efforts will not bring any result. This part of the Paper will therefore briefly discuss on the mechanism to generate income primarily through consultancies. It is true that for a variety of reasons, the capabilities of different universities are different. But it is also true that each university has some strength and if exploited properly, it is quite possible to generate income.

24. Today, there is hardly any worth the name university-industry interaction. Much of this is due to the lack of initiatives on the part of both, and an absence of a structured mechanism to motivate, mobilise and manage the consultancy activities. With the vast reservoir of experts and reasonable facilities that we have in the universities, there is a tremendous scope to increase the interaction with the industry over the next five-seven years if a good beginning is made without loss of time.

25. In Japan, in 1983, the number of researchers of universities accepted by industry was 56, which rose to 1241 in 1992. The joint research projects accepted was 66 in 1983 and rose to 11398 in 1992 as will be clear from the following figure.

## TRENDS IN RESEARCH COOPERATION WITH INDUSTRY IN JAPAN



Series-1 : Number of Researchers Accepted

Series 2 : Number of Joint Research Projects

Source: Page-49, MONBUSHO

26. Clearly, although Japan had started its journey to the direction of a developed economy as far back as 1960s, even as late as in 1983, the university-industry interaction was not at any satisfactory level. Precisely, it is better late than never. What is important is to make a good beginning.

## 1. MISSION STATEMENT

27. The move in the right direction, the first thing is to make an unambiguous mission statement by the university spelling out what it needs to do and how, so that across the system, various segments of the university society, namely, teachers, students and others, understand, appreciate and involve in the message. That is a sine-qua-non to meet success.

## 2. INVOLVING THE TEACHERS - HOW?

If the mission statement is to generate income, the community of teachers has to be convinced that there is a need to generate income and that moving in that direction is the need of the hour in a call of survival. They should also be explained what the mandate is. Although they 'hear' or 'read' about the 'mandate', the fact remains that neither all of them fully understand, nor are they convinced and therefore there is an absence of the right interest on their part.

What is needed is to draw up programmes of discussions, presentation and suggestions of different groups at different levels so that they feel the involvement and it is only then that positive response is expected, not before.

The message should also trickle down the line - to the students and others of the system.

## 3. INTERFACE AUTHORITY

Basic to all efforts in the direction of consultancy activities is the identification of an Interface Authority who

would function between the faculty and the industry and would, on one hand regulate the activities and on the other hand, ensure that the faculty is provided with all facilities conducive to smooth and efficient delivery system including taking care of the intellectual property, patenting, other legal requirements, financial aspects, etc.

### 3. WHAT INCENTIVES TO TEACHERS?

Unless the teachers are told that there would be incentives for them if they generate income, mere discussion will not bring any tangible result. For this, it is necessary to frame Consultancy Rules which inter-alia will provide the share of the real income between the university and the faculty and also what facilities the university will provide for consultancy activities.

### 4. DOCUMENTING THE CAPABILITIES

Most important of the various aspects of the mechanism is to document well, the capabilities of the university. It is really a difficult job requiring lot of vision and labour. Pre-requisites for this are -

- (a) identification of the teachers who possess the capabilities to independently undertake consultancy work with reference to their background motivation and commitment.
- (b) identification of the teachers who are not quite ready for independent work, but may be associated in such activities.
- (c) identification of the facilities which may be used by the teachers for consultancy work as also those facilities which

can be allowed to be utilised by outside agencies on payment of charges.

Once the document is ready, marketing should start to sell the expertise and facilities to market. In order that the selling is done to the right market, it is necessary to know the market for which, it is necessary to survey the market.

#### 5. HOW TO SURVEY THE MARKET?

It is necessary that the possible market is known including the potential of that so that marketing can start. While it is natural that the local market be tapped first for a variety of reasons, going to outside market that is outside the jurisdiction of the university would bring more credit and perhaps money. For this, all possible sources should be used, eg. personal contacts, contact through friends, and using various literature about the industries around. Groups should be formed for this purpose.

#### 6. HOW TO MARKET THE CAPABILITIES?

Once the document of capabilities is ready and generally the market is known, that the capabilities should be marketed aggressively with fixed targets. For this, the combined efforts of the Vice-Chancellor and the teachers would be necessary.

Importantly, a university-industry friendly atmosphere has to be developed for which there can be a number of ways that locally has to be decided.

## 7. ESSENTIALS FOR SUSTAINED UNIVERSITY-INDUSTRY INTERACTION

Sustaining the interaction is, if not more, at least as much important as the beginning of interaction itself. While this is not easy, but planned efforts can certainly achieve a good deal. Broadly, the following need to be taken care of -

- (a) quality of work
- (b) time-frame
- (c) teachers interest

Interest of the industry lies in the quality of work and very importantly, the time frame. On the other hand, every effort should be taken to ensure that the interest of the teachers is well sustained and well guarded for after all it is through them that the entire plan has to work.

## CONCLUSION

28. Inescapably, in a laissez-faire economy, the universities have to, for there is no option, do everything to generate income particularly the income through university-industry interaction. That, on one hand will generate income for the university and on the other hand reasonably ensure that the benefits of expertise and facilities of the university, reach the society.

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## **Financial and Educational Structure of A University - An Approach** (T.S.Murty)

The structure of cost of University education may be classified under two heads :

1. Operational costs in terms of teaching inputs, students welfare, supporting services and examination, and
2. Capital costs in terms of building, equipment/machinery and libraries - (compare them for affiliated, residential and professional colleges and central universities).

A significant percentage of the cost is spent on salaries -- shared almost equally by the teaching and non-teaching staff; only a relatively small proportion is available for physical facilities and developmental activities. Allocation for research is very negligible -- giving it a low priority. Teaching aids and library costs get scant attention and are treated as routine requirements. Expenditure for conducting examinations has been mounting; a proper study may have to be made about the link-up between conduct of examination, fees paid and expenditure on an increasing administrative set-up necessary for conducting the examinations.

### **II. Cost-Benefit Analysis**

The desirability of making a cost-benefit analysis in the field of education is often questioned but one may like to know the optimum enrolment for a given cost. The cost-effectiveness of education is being debated in some developing countries such as ours because of the fact that the delicate process of allocation of scarce resources for developmental and welfare programmes is approaching a stage of impasse. Maximum utilisation of available funds is, therefore, imperative.

Some universities have a set-up with a lop-sided growth, which is indicated by the disproportionate amounts being spent on maintaining an expanding administrative infra-structure, while according low priority to academic aspects of university education.

### **III. Principal Sources of Funds--Generation of Internal Resources**

The two principal sources of funds are

- (i) income from fees and other sources and
- (ii) grants from U.G.C. and government

Internal resources depend upon the level of fees charged. In India the level of fees operating today were fixed in 1950's and a revision has not been made though price level has shot-up nearly 8 to 10 times.



Fee income which, as a proportion of total expenditure, was around 30-35 percent in 1950, had come down to about 15 percent in 1976-77 in regular colleges/university departments; now it has further reduced to single digits in percentage. This falling trend needs to be reversed by raising the level of fees; this step is bound to generate more internal resources.

#### **IV. Aspiration of People to Acquire Higher Education**

Growing aspiration of people to acquire higher education has led to

- (a) Evening colleges for working people who could not afford regular study
- (b) Non-collegiate women Delegacy (catered) to the needs of women, who were deprived of the benefit of higher education in regular colleges/universities.
- (c) Correspondence courses to accomodate a wide spectrum of deprived people--people in rural areas, working men and women, house-wives, physically handicapped persons, persons working in armed forces and also the over flows of the regular colleges and university departments, who could not be provided a seat.

(b) and (c) were unfortunately viewed as profit making establishment.

Attempts to force the above three categories of unorganised students, who largely belong to the deprived sections of society, to pay higher fees, while their better-off counter parts, studying in regular colleges/university departments pay low fees, do not meet the ends of natural justice.

It is desirable to raise the level of fees in all the streams and also provide fee concessions and scholarships in all streams on a parity basis.

#### **V. Suggestions to strengthen the financial and academic base of the university**

- (1) Creation of interest in industry in scientific and technological research--even compulsory 'cess' on the turn-over so that the industries may gradually realise the importance of continuing research for better long-term profits.
- (2) Integration of teaching and research activities in the university
- (3) Closer interaction between teaching and research activities within the departments and inter-departmental co-operation for developing programmes of inter-disciplinary nature, either for front line academic research or for solution of societal problems.
- (4) Effective linkages amongst the universities, national laboratories and R&D organisations.
- (5) Teaching of post-graduate courses to be organised on a 'cluster-basis'. It is a waste of resources to permit every institution to run a post-graduate course in every subject.

- (6) Collaboration with international organisations like UNESCO in selected areas of specialisation.
- (7) Association with recognised private and voluntary agencies for entrepreneurship development programmes.

## **Structure of Education for a High-tech Society**

Rapid growth of science and technology has led to an accelerated social change all over the world and India is not immune from it. Some parts of our country are undergoing a transition from an industrial society to a high-tech society.

The trans-disciplinary experiments in space, aqua-villages, gene-industry, bio-fac-ture and artificial intelligence are bringing about new changes and a stage is coming for the integration of these changes, cutting across computers, electronics, new materials from outer-space and oceans on one hand and genetics and the new energy base on the other; the synergetic integration of these elements is bound to release a flood of techno-innovations beyond imagination. It is this integral technology which gets gradually into society making it a high-tech society, in which information and innovation are the critical resources.

## **VII. Frame-work For Higher Education**

It will be necessary to equip and train our young men, specially of the weaker sections of society, so that they can face confidently the challenges of the high-tech society and seize the opportunities (for their betterment) which such a society can offer. This will call for (i) scrutinising existing academic provisions (ii) understanding individual and sectorial needs (iii) bringing in new academic flexible structures, which can be modified from time to time, to keep pace with rapid developments in science and technology and (iv) identifying the outstanding needs at any point of time.

It is only such an exercise which will enable us to build a comprehensive frame work for higher education. Such a dynamic framework cannot be devised with the present educational system which continues to be traditional in which teacher is the principal input and chalk and duster are the other aids for instruction. The new system will need to be equipped with gadgets of modern educational technology the devise new teaching methods to cope-up with the 'explosion' both of knowledge and student population.



**INDUSTRY-INSTITUTION COLLABORATION**  
**BHEL EXPERIENCE**

By Dr V.D.Garde  
Adviser, BHEL, Bhopal

1. **INTRODUCTION**

- 1.1 Science and Technology has a crucial and vital role in the economic advancement of a country. It is an important instrument of social and economic change and as a result of its development and application, it has been accepted as a major objective in our national plans and policy statements. This acceptance and belief in science and technology was embodied in the historic Scientific Policy Resolution of the Government of India adopted in 1958. As a result of the Government's emphasis on development of science and technology over the last three decades, there are today more than 450 engineering colleges and 600 polytechnics. India today is reckoned to have the third largest employment of scientific and technical manpower in the world.
- 1.2 To complement this effort, more than 130 specialised laboratories and institutes have been established. Further, public and private sector organisations and undertakings have established over 600 in-house R&D laboratories to meet their internal technological requirements.

1.3 We can today look with pride on the strides that we have taken in the past three decades. There is now a reservoir of expertise available, well acquainted with modern advances in basic and applied areas. Scientists and technologists have distinguished themselves in industry, educational institutes and laboratories. This paper reviews the BHEL experience in joint or sub-contracted development projects with different academic institutions and makes recommendations for better results in such interaction.

## 2. **NEED FOR INDUSTRY-INSTITUTES LINKAGES**

2.1 Academic world and industry together hold the key to technology development in many of the core areas of the economy. Yet, if engineers and professionals are to contribute to the technological progress expected of them, they must perforce be educated and trained for that purpose. This cannot be achieved by merely increasing the number of colleges and polytechnics and their educational facilities.. The increasing nature of the 'KNOWLEDGE EXPLOSION' coupled to the changing and varied needs of industry dictate that both universities and industry must work in unison to achieve this purpose.

2.2 The need for industry-institute linkages is also necessary from the fact that the university is the source of new ideas and fresh personnel for industry. As a result the survival and renewal capability of industry depends on the injection of the new talent being produced by the universities. Hence, industry and academy must work together more closely to their mutual benefit. The universities will gain in-sights into the problems of industry through this joint approach, thus providing them with a base for direction of educational and R&D. Industry will reap the benefits of graduates who have some familiarity with and understanding of the industry.

2.3 The need for meaningful linkages between industry and universities has been given prominence in various forums. The country's master document - 'The Sixth Five Year Plan' - has also dealt at length on this aspect. This document has very aptly emphasised this need:

"It is clear that the major investment areas in our plans require a much more deliberate and sustained application of science and technology than hitherto. This requires not only financial support for S&T activities but linkages between the various sectors (educational, R&D establishments, industry and Governmental machinery)."

### 3. **THE BHEL EXPERIENCE**

The BHEL experience on interaction and linkages with technical institutions was surveyed through a questionnaire and the findings are based on this data.

3.1 BHEL has been promoting interaction with technical institutes from its earliest days. This interaction has not been limited to mere exposure of students to the industry environment, but is broad based and consists of:

- BHEL engineers delivering lectures at the institutes.
- accepting teachers from the institutes for further training, experience and Quality Improvement Programme (QIP for college faculty).
- Joint projects.

Some of the colleges with which BHEL has linkages are:

- University of Roorkee, Roorkee
- IIT, Bombay
- MACT, Bhopal
- REC, Warangal
- IIT, Madras
- REC, Tiruchi
- IIM, Ahmedabad, etc.

An exhaustive list is given at the Annexure.

3.2 BHEL is accepting a large number of trainees every year. More than 650 trainees are taken annually at Bhopal alone. Most of the trainees come for vocational training and are exposed to the practical industrial environment.

3.3. BHEL engineers are delivering lectures both for the graduate and post-graduate courses at nearby technical colleges. The majority of the lectures are for the post-graduate level. As can be appreciated, this is limited to those BHEL units which have technical institutes in the vicinity. At the Maulana Azad College of Technology, Bhopal, for example, a UNESCO sponsored M.Tech. course in Heavy Electrical equipment design has been conducted since 1967, a majority of the external faculty being from the BHEL, Bhopal unit.

3.4 More than 26 projects have been taken up in the last 3 years of which about 16 have been completed. In most cases these projects have been funded by BHEL.

3.5 Rating of work:

In general the work carried out by the institutes has been found to be useful. On a scale of 'Unsatisfactory - of use - very useful,' it was found that the work done was in between the 'Of use' and 'Very useful' rankings. However, in spite of the general utility of the work being carried out, there were instances in which the work was found to be of little use.



### 3.6 Link Person:

Most of the BHEL units have experienced the lack of a link person at the technical institutes. Though a link person was available in some institutions, in most cases there was no such person available. It is felt that any institution wishing to have joint projects with industry must have a liaison officer to enable one point contact with the institution. He can take up promotional work as well. Most institutions have, for example, a "Professor of Placement and Training" to look after the interests of students in employment in training facilities in industry.

### 3.7 Standard Contract Formats:

Some institutions were found to have standard contract formats. However, these were few in number and in the majority of the cases there were no standard contract formats. This is necessary with some alternatives for smooth functioning of any industry - institution cooperation.

### 3.8 Patents:

No patents have resulted from this joint effort in the last 13 years.

#### 4. ~~DESIGNED~~ LINKAGES

4.1 There are many shortcomings and deficiencies in the existing mode of interaction. As a result the linkages have yet to attain the desired level of strength and utility. To make the linkages strong, meaningful and fruitful, both industry and the institutes will have to understand better each others' roles and objectives. It is not that there are contradictions in the roles and objectives - only a difference in priorities and perception. Each will have to supplement and complement the other with the proper understanding and appreciation of the objectives, needs and responsibilities.

4.2 What then are the shortcomings that are being experienced? From a survey of the experiences of the BHEL units, the following deficiencies cropped up time and again:

4.2.1 Institutes do not conform to a time bound programme. There are delays in execution and quite often there was weakened interest as the project lingered on. It must be remembered that industry has very tight, time bound schedules which have to be met.

This has become all the more important after opening of the Indian Economy through liberalisation, and intense competition with foreign multinationals.

4.2.2 Institutes resent the linking of specific objectives to financial implications and were generally averse to progress reviews.

4.2.3 Quite often the projects are considered as an academic pursuit. There is reluctance to take up practical design problems. It would be appreciated that there is a considerable gap between the R&D prototype and the one for final manufacture with detailed engineering. This gap should be narrowed in joint ventures.

4.2.4 Documentation of the procedure and results is not given importance. The methodology and results of the R&D project must be documented in detail in a project completion report.

4.2.5 In many cases continuity is lacking as the M.Tech. student may leave before the project is completed.

4.2.6 Often BHEL is considered more as a funding agency than a partner.

4.2.7 Few visits to the plant by the faculty.

4.2.8 Inadequacy of Test stands at institutions.

4.3 The institutes and industry will have to make concerted efforts to overcome the current problems and inadequacies. The development and strengthening of lasting linkages will hinge to a large extent on identification of those areas of interaction and collaboration which are of mutual benefit and will contribute to the quality of the personnel turned out by the institutes. Some of the areas which could be gainfully explored are:

4.3.1 Plant training and visits: Institutions could supplement the knowledge being imparted to students by making use of the tremendous facilities available in industry. Students can be sent to industry for in-plant training vacations so as to expose them to the industrial situation. Further short visits could also be arranged as a part of the normal classes. These visits and in-plant training can be a part of the curriculum.

4.3.2 Thesis/Project work: Industry could come forward with problems which can serve as project work. The projects would not only enable industry to utilise outside talent but also give students exposure to the industrial set up.

- 4.3.3 Honorary Faculty: The expertise and capability of executives/technical personnel in industry can be utilised by the institutes by creating adjunct professorships. This will not only add to the institute's capability but also enable greater mutual understanding. Some arrangements for "Sabbatical" work should be explored and instituted.
- 4.3.4 Faculty association with Industry: Besides exposing students to the industrial situation, it would also be fruitful to associate faculty members to industry. This could be done by creating a 'residency' for faculty members. This would create greater understanding of each other's problems and needs.
- 4.3.5 Joint R&D: Joint R&D can be made more meaningful and fruitful than is currently the case. By observing time frames, financial implications and having proper documentation much more could be achieved.
- 4.3.6 Advanced education: To ensure continuing education of its executives and technical personnel, industry could interact with institutes to design courses to meet their specific needs. This could be extended to include short-term refresher courses, seminars, workshops etc. so as to form a total continuing education system.

- 4.3.7 Coordination: Institutes could devise a system so that link persons, standard contract forms etc. could be available to industry.

## 5. **RECOMMENDATIONS**

- 5.1 India is a country of scarce resources. As a result, it is necessary that the existing resources are optimally and efficiently utilised. Both industry and institutes have a wealth of knowledge which can be used gainfully to mutual benefit. For this purpose the current modus operandi of institutes and industry working in isolation must be replaced by a meaningful interactive mode of working.
- 5.2 To make industry - institute interaction more fruitful and effective we suggest that the following recommendations be pursued:
- 5.2.1 The institutes should have a link person who will function as a single point contact.
- 5.2.2 The institutes should have a directory of faculty and the facilities available. The link person could provide this directory to industry as well as take up promotional work.

5.2.3 The institutes should have standard contract formats to enable smooth functioning.

5.2.4 Regular progress reviews with a reporting system.

5.2.5 Properly documented completion reports.

5.2.6 "Fast track" purchase procedures for R&D.

## 6. ACKNOWLEDGEMENT

I would like to thank the Management of Bharat Heavy Electricals Limited for permitting me to present this paper.

**COLLEGES WITH WHICH BHEL HAS LINKAGES**

1. IIT, Bombay
  2. MACT, Bhopal
  3. College of Engineering, Trivandrum
  4. REC, Warangal
  5. IIT, Kanpur
  6. IIT, Madras
  7. Birla Institute of Science & Technology, Pilani
  8. IISc, Bangalore
  9. IIT, Delhi
  10. REC, Tiruchi
  11. Osmania University, Hyderabad
  12. Central University, Hyderabad
  13. BHU, Varanasi
  14. IIT, Kharagpur
  15. University of Roorkee, Roorkee
  16. IIM, Bangalore
  17. NITIE, Bombay
  18. IIM, Ahmedabad
  19. Guindy Engineering College, Madras
  20. PSG College of Technology, Coimbatore.
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# THE NEED FOR COOPERATION BETWEEN UNIVERSITY AND INDUSTRY IN INDIA

D.

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## THE NEED FOR COOPERATION BETWEEN UNIVERSITY AND INDUSTRY IN INDIA

The need to forge closer interaction between industry and university education has long received attention, especially in the more developed nations of the world. Although the clamour about global competition, world markets and diffusion of technology is familiar to developed countries and developing ones like India are increasingly concerned about how to jump start new engines of economic growth and attain international competitiveness for their goods and services. With the emerging new global economic order, the time for ageing of technologies is becoming shorter and shorter. Beset by intense international competition, volatile markets and budgetary constraints all under dark clouds of recession the science and technology education in developed countries is undergoing a profound transformation. This calls for making a positive response by the developing one through broadening the field of vision of their science and technical education institution instead of merely maintaining their academic superiority.

The purpose of this paper is to review the current situation between the university education and industry in India and to make a case for stronger links between them.

### THE PRESENT STATE OF COOPERATION IN INDIA

India is a rapidly developing country that has devoted much of its resources to education since independence in 1947. India presently has nearly 176 Universities and 150 laboratories along with nearly 7000 colleges imparting graduate and post graduate education. However, this rapidly expanding education system is paralleled with Technological and industrial backwardness.

A survey of the form of interaction between industry and universities shows that only two type of cooperation is operational (i) four weeks training of engineering graduates to industries in their final year and (ii) sporadic organization of visits to industries by students. Cooperation in teaching and research, which are regarded as very important are virtually non existant. The conclusion then is that University / Industry interaction in chemistry in India is at its infancy and at a much lower level than expected.

Many reasons for this lack of cooperation are there, but a full discussion is outside due scope of this paper. Suffice is to say that neither the industry nor universities have recognised the need to cooperate.

#### THE NEED TO COOPERATE

##### (a) Manpower provisions

Various studies conducted in India have highlighted the paradoxical Technical manpower situation of surplus labour in certain categories co-exist with shortages in others. Thus there is shortage of persons possessing specific skills and expertise while there is unemployment among qualified persons. This is largely due to lopsided development of our science and Technical education system with neglect of technical training and over emphasis on basis courses in self sealed or isolated institutes.

it is necessary to make the education and training in universities as realistic as possible, there by fullfilling the need of industry for appropriate qualified manpower. It is time when curriculum planners took the vocational future of their undergraduates into consideration. The lack of cooperation between industries and universities is an example of a lack of relationship between theory and practice in the education of Indian Scientist and

technologist. Successful cooperation will not only make education in the Universities relevant to the economic and industrial development of India but also will provide industry the opportunity to express its needs and preferences.

(b) Research

There is a strong need to develop indigenous technology in India. Due to the approval of Dunkel draft and GATT treaty by India, we have to respect the patent rights in regard to both product and the process of manufacture. This has led to a situation which would result in the need to have properly trained manpower which can compete at the international level. This will come in part as a result of University teachers looking at the problems of local industry as research problems. This is all the more necessary if it is remembered that (1) the bulk of the country's Scientists are concentrated in the universities and (2) research and development facilities are virtually non-existent or in infant state in Indian Industries.

Enrichment of Teaching and learning

It is accepted by educators that learning is enhanced greatly by first hand experience. Direct experience, which could enrich the educational experiences of teachers and their students could be provided through various patterns of interaction between universities and industries. For example, work experience for students, part-time teaching in universities by industrialist, consultancy for university staff, few industrialists be given representation on the governing bodies which would generate necessary climate and enable the university to gainfully interact with industries.

These are some of the suggestions to make teaching and learning lively.

### Continuing Education:

Knowledge is growing at an increasing pace every day and so is the development of new techniques and process. Thus it is very easy for those teaching and researching in Universities to become out of touch with practitioners in industry and vice-versa. The philosophy of continuous evolution of technology or "Kaizen" as it is called in Japan has received little attention from our science and technology fraternity. The success of developed countries can be attributed primarily to their timely development of sound continuing education system.

The success of all economic reforms will be governed primarily by how well we provide the retraining avenues to the labour force to be redeployed. Failure to provide the retraining opportunities would result in large scale industrial unemployment and unrest and jeopardise the very objective of new economic reform programme being implemented in India.

### Financial support:

Industry generates the wealth for maintaining and developing university education indirectly through taxation. Successful cooperation would afford industry the opportunity of making sure that funds contributed by it are properly utilised. On the other hand, and awareness of the financial problems of universities gained through cooperative endeavors could encourage industry to contribute both money and equipment directly to universities. Especially industry could support research by awarding grants or fellowship or by sponsoring post graduates.

# TECHNOLOGY PARK-ITS RELEVANCE IN RESOURCE GENERATION

DR. D.D. AGRAWAL

## Introduction

The present policy for science and technology is aimed at giving a renewed sense of purpose to indigenous technology for its accelerated development and use in the context of Industrial policy statement of 1991 and keeping in view the need to adhere to international quality standards. Obviously the Government has devised numerous schemes to industrialization and granted huge financial resources for their implementation. India has third largest technical manpower in the world alongwith vast natural resources like minerals, iron ore, coal, land, water etc. However, the output from industrial sector, although increasing, is not commensurate. The productivity is far too low compared to world standards. Apparently it is not that the people work less or are less intelligent. What is lacking is perhaps the industry is not tuned to utilize the vast potential of scientific talent & expertise through close interaction though it needs access to high quality research in order to be competitive in international market. It is essential that the technology conversion process must be made efficient and as fast as possible.

The concept of science park was initiated around 1950 in Stanford, USA. Now, North Carolina research triangle park, adjacent to three Universities, is occupying 6550 acres of land. There are more than 9000 Ph.D's employed in these parks. It is estimated that each one is adding value more than \$ 1.25 lacks to the park fund. There are more than 300 affiliating companies to M.I.T. Boston, for exchange of scientific technological ideas. Each company is paying around \$ 1.00 lacks in return. Emergence of new technology based industries with the association of leading edge experts in higher education institutes is becoming the modern trend. It is obvious from the fact that now new industrial complexes, worldover, will be coming up only around universities/technical institutes.

## Technology Transfer

Technology transfer is a phenomenon which involves three distinct steps i.e., invention, innovation and dissemination. An invention is finding truth by itself has no economic value. An innovation based on invention, can become commercially valuable. For instance, the invention that an atom can be split has no economic value unless an atomic reactor which is an innovation based on invention, can become commercially valuable. For instance, the invention that an atom can be split has no economic value unless an atomic reactor which is an innovation came into existence and the know how could be marketed. Even the reactor is of no advantage to the public unless it is built and used in large numbers to generate electricity. This step is the dissemination.



In advanced countries, when an innovation is made industries and entrepreneurs are alert to perceive its commercial potential. they quickly integrate scientific advances into the marketable product. We have scientists & technologists of international repute and technological institutions that are comparable to the best in world but we have yet to develop a scientific temper. Consequently we need organizational mechanism to effect the transfer of Technology in order to put to fuller use of available technology.

In industrially advanced countries, there are Technology parks attached by technological institutions/universities which are found to be very effective for the purpose of technology transfer. The Department of Science and Technology has started a scheme of S & T Entrepreneurs Park (STEP). The main objectives of the STEP are :

1. To facilitate the transfer of Technology from laboratory to industry as quickly as possible to reduce the lead time between invention, product development and commercial application which improves competitiveness of industry.
2. To provide a platform to the entrepreneurs for starting enterprises without wasting their time and energy on establishing infrastructure which enable them to focus on achieving technological excellence.
2. To establish a close relation between institute and industry and permit theory to influence practice for its continued upgradation.
4. To create an environment in which highly skilled technologists feel proud to work and make significant contributions.
5. To make higher education relevant, purposeful, upto date and cost effective.
6. To provide a incessant flow of technology from institute to industry. Transfer of technology is not left to chance but a well defined efficient and proper mechanism is provided.
7. To provide safety to clients from exploitation and cheating by some unscrupulous consultants.
8. To facilitate development of indigenous technology and to reduce dependance on imported technology.
9. To ensure that the resources are allocated to genuine entrepreneurs.
10. To step up the capacity utilization of laboratory facilities and the available technical manpower.

11. To provide expertise in latest Technologies to young and enthusiastic entrepreneurs.

### Technology Park - Definition

A Technology park is nothing but an industrial complex, close to a place of learning, engineering institution, polytechnics or a research laboratory having formal operational links between them. It is designed to encourage formation of knowledge based industries starving for high quality products and provides a pleasant environment. It has a management function for transfer of technology and business skills to enterprises on its site. It provides accomodation to tenant companies on rental basis. It aims to reduce time gap between invention, innovation and commercial application.

There are various kinds of parks like business park, innovation centre, research park technopolis etc, the names are used interchangeably. There are finer difference between them depending upon the thrust. In research park, various companies are welcomed to establish their research departments. The research personnel benefit most from interaction with the academicians in the institution. Often they undertake joint collaborative research so as to accelerate the pace of research and compete in the international market. This interaction will be beneficial to P.G. Students as they will get an early exposure to industry problems and develop an analytical mind to solve them through innovative approach. The effects of this interaction will percolate even in undergraduate level which will improve the quality of graduates. The reputation and earnings of the institute will go up in the process. The innovation centre consists of a group of buildings close to centre of academic excellence providing accomodation and other facilities on short term basis which enable to develop ideas to start small business firms. Business park provides accomodation in which a wide variety of activities such as manufacture, showroom, distribution etc can be performed. Technopolish provides high quality infrastructure with all kinds of services needed by a firm or hi-Tech industries near the institutions and research laboratories.

In U.K. several such parks are flourishing. These parks are run not by engineering departments alone but by the autonomous organization established specially for the purpose. The management rests with directors from associations of industry, municipalities, banks, financial institution etc.

The role of the engineering institution is like a promoter and catalyst. The parks are situated in the immediate vicinity of the institutes campus which facilitates easy communication between faculty and entrepreneurs. The laboratories, library, computing centres of the institutes are shared also by entrepreneurs on payment basis. These parks provide all the infrastructure like space, electricity water, telephone,

security, etc. All these facilities are taken care of by the organization managing the technology park, the entrepreneur can concentrate on his enterprise without any loss of time, thus increasing entrepreneurship success rate.

### Systems and Procedures

The prospective entrepreneur makes an application to management for space in the park. The selection is made by a committee of experts on the criteria that the project should be using advanced technology not otherwise. The institute faculty is also encouraged to take active part in the establishment and running of these enterprises. Some students also take part and earn while they learn. The technology park participate in international exhibition and, therefore, even small enterprises automatically become known in the international markets. Some parks also have marketing companies which undertake marketing of products. Likewise other specialized services including personnel training, recruitment are also provided to small entrepreneurs. The small scale companies have enough freedom and autonomy to try innovative ideas. When these entrepreneurs grow into a big company, they transfer themselves to a bigger industrial estates.

The size of technology parks is growing every year and many of the professors have themselves become successful entrepreneurs. The first science park was established in Stanford University in 1950. The science park however, picked up momentum after 1980 and have multiplied 200 folds in USA, 52 in UK, 86 in Germany and 27 in Japan, and many more are in the process of establishment. In India there are about eight parks under establishment.

### Performance evaluation

Science park Association of U.K. has evaluated the performance of all park and their contribution. The performance evaluation of enterprises on park is far superior than similar off park enterprises. The employment generation is fast and of high quality besides increased industrial output. Performance of conventional industry has also increased because of the emergence of parks. The inflow of the funds through these parks have helped the Universities to enhance the scholarships to the students.

The major contribution in Technology parks has come through the academicians. Their increased interaction with industry has resulted in improvement in educational standards. Many hi-tech enterprises perhaps would not have even flourished if there was no scheme of such parks.

The government role has been central to establishment of those park in all countries in the world. The higher education institutes have undoubtedly been the leaders of this change. The Universities, IIT's and engineering college in India would also have to perceive the roles being played by their counterparts elsewhere in the world and adopt an attitude favourable for promotion of entrepreneurship. They have a valuable reservoir of knowledge, experience and talent and can play a leading role in initiating installation of technology parks. For want of such parks the knowledge and experience remains underutilized.

The service conditions of academic staff have to be reviewed so as to facilitate them to apply their knowledge to professional practices, perhaps on part-time basis without jeopardizing Teaching and their academic strength.

Parks fulfils the main objective of nation building because of low failure rate of enterprises and high employment and economic growth. In view of large scale sickness in small scale industry and unemployment situation in India, establishment of Technology parks merits high consideration for vigorous implementation in near future. Technology and economic progress are linked with each other and to translate technology into commercial achievement the park offer a much better proposition.

Technology Parks has come to be known as a major source of creation of new technology based industries. It has proved to be very effective in tapping the valuable resource of knowledge of academicians for the growth of technological skills and productivity. The scheme is found to be specially useful to promote employment, industrial development and making the education more relevant and purposeful. Besides this it helps in generating funds for the institution.

## Conclusion

India needs establishment of technology parks most in view of the new Industrial policy and the economic liberalization. The following conclusions can be drawn :

It is not enough now to produce engineers from institutes located in industrially backward areas. The establishment of technology park and its environment will motivate the PG as well as UG students to start their enterprises and not migrate to other places. They will get the expertise as required and will have no fear of failure as the failure rate of enterprises is low on parks.

Technology parks are more pertinent for qualified engineers and scientists and academicians in engineering colleges. Parks are also important for government administrators, banks etc. who are vested with powers of decision making. Technology park will prove to be a better tool for resource generation.



(With special reference to Resource Mobilisation)

Dr. J. L. AZAD

The system of education in general and higher education in particular has been subjected to sharp criticism for its apparent incapacity to provide education relevant to the needs and aspirations of the teeming millions of India. It has been pointed out that the system of higher education has developed an inbuilt process of metabolic degeneration in that about half of the students entering the portals of university institutions are thrown by the wayside resulting in a huge loss of human and financial resources. The phenomenon of over-escalating unemployment and under-employment of the educated youths has further aggravated the situation.

In the wake of denigration of higher education, it is conveniently forgotten that, higher education is a crucial factor of survival, because it provides people with "an opportunity to resist on the official, social, economic, cultural, moral and spiritual issues facing humanity. It (also) contributes to national development through dissemination of specialised knowledge and skills" (National

Policy on Education, 1986 p.1). It is also forgotten that, particularly

after the attainment of independence, the institutions of higher education have been almost inundated by the never-ending streams of young men and women aspiring to get university degrees. Since the mid-sixties, the universities have been subjected to an unprecedented financial squeeze, which has<sup>1</sup> made even the maintenance of the institutions of higher education a difficult proposition.

The situation has been aggravated by the almost drying up of contribution from private philanthropy. Under the circumstances if the university development is lop-sided and incongruous, the reasons are not far to seek.

In this paper, we propose to discuss the problems of financing of higher education under the following heads:

- 1) The behaviour of higher education finance;
- 2) The New Economic Policy and its implications for higher education.
- 3) The scope, techniques and process of resource mobilisation.

## THE BEHAVIOUR OF HIGHER EDUCATION FINANCE

### OVER ALL EXPENDITURE

#### a) All India

There has been a rapid growth in the expenditure on education in India since the dawn of Independence. In 1950-51, an amount of Rs.114 crores per annum was spent on education, which was 1.2. per cent of the Gross National Product. According to latest estimates, the educational expenditure is expected to be of the order of Rs. 20,750 crores, which works out to 3.7 per cent of the GNP. It may, however, be mentioned that it is still far short of the target of 6 percent of the GNP set out by the Education Commission ( 1964-66) and reiterated by the National Policies on Education, (1968 and 1992).

The expenditure on higher education also registered considerable increase: from a modest sum of Rs. 18 crores in 1950-51, it has gone up to about Rs. 3000 crores in 1992-93. In terms of proportion to the national income, the percentage increased from 0.2 to 0.5 during the period under study.

In the field of research and development, India has made significant progress. The expenditure on R and D and



related scientific and technological activities increased from a paltry sum of Rs. 1.1 crores in 1947-48 to Rs 4830.6 crores in 1992-93 /2.

### Plan Expenditure

There has been considerable increase in the developmental expenditure on education in the Five Year Plans. From a modest amount of Rs. 153 crores in the First Plan, the Plan investment stands at an apparently formidable figure of Rs. 21,217 crores in the eighth Plan. So far as higher education including technical education is concerned, the expenditure increased from Rs. 22 crores in the First Plan to an estimated Rs. 4,302 crores in the eighth Plan. In terms of proportion to the total outlay for education, the expenditure on higher education increased from 22 percent in the First Plan to 38 percent in the fourth plan. Thereafter, however, there has been a steep decline, so much so that there is no mention of outlay for higher education in the seventh and eighth plans. The estimated percentage for the seventh and eighth plans would, however, be 29 and 22 respectively, much below the proportion in the fourth plan.

b) Declining participation by the Central Government

It has been noted that the Central Government has been investing proportionately lesser amounts in the development of educational programmes. In the first plan, the Central outlay was 4.4 percent of the total outlay for central programmes.

In the Sixth Plan, the proportion was reduced to half i.e. 2.2 percent. In the seventh plan, the position has somewhat improved in that the proportion stood at 2.5 percent. In the Eighth Plan, it has further improved to 3.3 percent. The figure is, however, far short of the position in the first plan.

The declining trend is also discernible in the Central Government's participation in the overall expenditure on education. In the Seventh Plan, out of the actual expenditure on education of Rs. 8568 crores, the expenditure by the Central Government was of the order of Rs. 3423 crores indicating a percentage of about 40. In the Eighth Plan, the Central Government's investment will be of the order of Rs. 8178 crores out of a total proposed outlay of Rs 21217 i.e. 38.5 percent of

the overall outlay. Bulk of the outlay under the Central Government is for University and technical education, which, as we have noticed in the preceding analysis, is not adequate.

e) States

Inspite of the fact that education has been included in the concurrent list of the Seventh Schedule of the Indian Constitution, the State Governments are the main agencies for the administration and financing of educational programmes, particularly at the school stage. It has been found that quite a number of states are spending about one fifth of their Revenue budgets on education. Among the major state (excluding Jammu & Kashmir) Haryana with 15.9 percent of expenditure on education as a proportion of the total revenue budget in 1992-93 had the dubious distinction of being the lowest while the corresponding figure for Kerala was 26.2, the highest among the states under review. In terms of the per capita budgeted expenditure on education for the same year, U.P. with Rs. 147.8 ranked the lowest. While the highest per capita expenditure was recorded by Punjab (Rs. 315.0).

It has also been noticed that there has been lack of consistency in the average annual growth rates of expenditure on education as also of enrolment. During the quinquennium 1951-56, the expenditure grew at the rate of 5 percent per annum while the enrolment rose at about 7 percent per annum. The quinquennium between 1971-76 witnessed the most imbalanced growth; while the expenditure grew at the rate of 13 percent per annum, the enrolment registered an average annual increase of 3 percent. This shows that there is very little relationship between growth rates in enrolment and expenditure. Both these variables seem to be growing independently of each other.

#### Inter State Comparisons

The inter state comparisons were sought to be studied by taking two variables: State's capacity' in terms of the per capita net domestic product and State's 'effort' as reflected in the per capita expenditure on education. The states were ranked on the basis of these variables and rank correlations were computed for the selected years. The following table explains:

#### Table:

Rank co-efficients of correlation between N.D.P. and per capita expenditure on education- Total education, elementary, secondary and higher education.

	1960-61	1965-66	1970-71	1975-76	1980-81
DP and Total Education	0.78	0.63	0.65	0.71	0.56
DP and Elementary Education.	0.50	0.39	0.42	0.42	0.30
DP and Secondary Education.	0.63	0.71	0.73	0.82	0.54
DP and Higher	0.74	0.58	0.46	0.37	0.19

( For details, See Azad, 1984: 9-10)3

It would be noted that there has been over all diminution in the co-efficients of correlation between the per capita net domestic product and per capita expenditure on all sectors of education during 1961-81. It means that over the years, the NDP is becoming an irrelevant factor in determining the quantum of finances available for education.

#### d) Emerging Problems of University Finances

At the outset, it is appropriate to sound a note of caution, so that the apparent large size of the expenditure should not lead to a sense of complacency. The following characteristics are worth mentioning;

- a) The educational expenditure in India, though sizeable, stands on comparison even with some of the developing countries;

- b) The observed increase in expenditure is somewhat illusory in that much of the increase has been counterbalanced by the steep erosion in the purchasing power of money;
- c) The growth of expenditure as also that of its main constituents is somewhat lopsided;
- d) The investment in education is inadequate in relation to the fast growing needs of education;
- e) The behaviour of developmental expenditure for education in the successive Five Year Plans has been inconsistent and erratic.

It has been reckoned that about 40 percent of the universities had recurring deficit budgets. In response to a specific question whether the state grants were adequate for the maintenance and development of the colleges and universities, an overwhelming majority of colleges and Universities (78 percent) vouchsafed the inadequacy of state grants. The measures adopted to meet the deficit were: keeping schemes in abeyance, keeping staff positions vacant and reducing expenditure on buildings.

It has also been seen that large bulk of university expenditure (about 72 percent) is on staff salaries resulting into inadequate expenditure on other

items like equipment libraries etc.

The erosion in the value of money has also done havoc with university finances. According to studies made by the present author, while the per student average annual expenditure at the higher education stage in 1960-61 was Rs. 557, in 1980-81, it was reduced to Rs. 357.

There has been a very steep decline in the contribution from private sources. While in 1947, the private organisations contributed about 12 percent of the educational expenditures, it has come down to 3 percent. In case special efforts are not made to mobilise private resources, this source of finance will cease to be a reliable factor in the educational finance.

## THE NEW ECONOMIC POLICY (NEP)

The main features of the NEP put into operation in 1991, are that it reverses the trend towards State Control and State Administration of the various factors of production. It makes substantial and fundamental changes in the process of socio-economic development, fiscal and monetary policies and domestic resources allocation patterns. The accent in the NEP is on decontrol, decentralisation, foreign equity participation and privatisation. Another important constituent of NEP is the 'exit' policy under which the inefficient and sick PSUs are to be phased out.

### IMPLICATIONS FOR EDUCATION

Before discussing the implications of the NEP education, it may, with ample justification, be argued as to why should the new economic policy have any relevance for education. After all there have been a spate of new policy documents : the new industrial policy, the new agricultural policy, the new transport policy and so on. Further the government has also formulated a new Policy on Education which is more recent than the Economic Policy. Incidentally, it may also be mentioned that the National Policy on Education (1992) does not make any specific mention of the New Economic Policy.

It may, however, be mentioned that the New Economic



from the existing paradigms of development, fiscal policies, and domestic resource allocation patterns. It reverses the regimen of state controls, state monopoly in specified sectors and an implicit distrust of the private sector. On the contrary, it ushers in an era of liberalisation, decontrol, encouragement to the private sector and an open invitation for foreign (including MNC's) equity participation. It would, therefore, be unrealistic to assume that the NEP is irrelevant for sectors like education, which have been consistently placed under the somewhat misleading head of 'Social Services'.

We shall initiate the discussion of the impact of the NEP on Education by taking an extreme formulation. A logical corollary of liberalisation and decontrol should mean dismantling of the State machinery for the administration, financing and regulation of educational institutions. To be specific, it should allow market forces to determine:

- i) the size of enrolment in various courses of studies.
- ii) the establishment of new institutions and the expansion of existing educational institutions.
- iii) the development of curriculum to suit the changing requirements of the country, and
- iv) fixing up the costs of education, the fees to be charged and tapping other sources of finance.

In fact, decontrol should mean that private bodies would be free to set up educational institutions, to administer them in the manner they like, lay down courses of study and fix up the quantum of financial resources to be obtained from the parents. The State would mainly be a spectator to the play

of market forces, which would have the fullest scope for operation.

This kind of privatisation of education would have far reaching consequences for educational development. It would make education as a commercial enterprise in which there is possibility of unscrupulous elements ( and we have no scarcity of this species) exploiting the system to fulfil their nefarious designs. It would amount to virtual selling of seats to the highest bidder regardless of his capacity to profit by it. Under this system, the paying capacity of the student and not his merit would be the deciding factor. It would also lead to a skewed development of education because profit motive of the private entrepreneur rather than the academic needs of the society would be the deciding factor in the establishment and expansion of institutions.

It would be admitted that besides being a consumption good, education is also an investment in human capital, which is instrumental in accelerating the pace of socio-economic development of the country. It is, therefore, too serious an enterprise to be left to the free play of market forces. The society has a vital stake in education and therefore the government cannot abdicate its responsibility of developing an educational system most suited to the requirements of the society. So, notwithstanding the liberalisation and decontrol envisaged under the N.E.P., complete privatisation of education is ruled out. It would create more